

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 07 June 2001 (07.06.01)	Applicant's or agent's file reference 14114.0342P1
International application No. PCT/US00/19267	Priority date (day/month/year) 15 July 1999 (15.07.99)
International filing date (day/month/year) 14 July 2000 (14.07.00)	
Applicant FIELDS, Howard, A. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

09 February 2001 (09.02.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Henrik Nyberg

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

SPRATT, Gwendolyn, D.
Needle & Rosenberg, P.C.
127 Peachtree Street, N.E.
Atlanta, GA 30303
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 28 août 2001 (28.08.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 14114.0342P1	
International application No. PCT/US00/19267	International filing date (day/month/year) 14 juillet 2000 (14.07.00)

1. The following indications appeared on record concerning:

☒ the applicant

 ☐ the inventor

 ☐ the agent

 ☐ the common representative

Name and Address

 THE GOVERNMENT OF THE UNITED
STATES OF AMERICA, as represented
by THE SECRETARY OF THE DEPARTMENT
OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and
Prevention, Technology Transfer Office
Building 4, Suite 1103, M/S E-67
Executive Park Drive
Atlanta, GA 30329

State of Nationality

US

State of Residence

US

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person

 ☒ the name

 ☒ the address

 ☐ the nationality

 ☐ the residence

Name and Address

 THE GOVERNMENT OF THE UNITED
STATES OF AMERICA, as represented
by THE SECRETARY, DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Centers for Disease Control and
Prevention, Technology Transfer Office
1600 Clifton Road, N.E., M/S E-67
Atlanta, GA 30333
United States of America

State of Nationality

US

State of Residence

US

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Fiona DOHERTY Telephone No.: (41-22) 338.83.38
---	---

RECEIVED

SEP 05 2001

NEEDLE & ROSENBERG

PCT

PATENT COOPERATION TREATY

PDS/WBS/THM

DOCKETED

From the INTERNATIONAL BUREAU

Date 9/5/01

To:

Reviewed [Signature] 10/1/01
Name/DateNOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)SPRATT, Gwendolyn, D.
Needle & Rosenberg, P.C.
127 Peachtree Street, N.E.
Atlanta, GA 30303
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 28 August 2001 (28.08.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 14114.0342P1	
International application No. PCT/US00/19267	International filing date (day/month/year) 14 July 2000 (14.07.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address

THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention, Technology Transfer Office
Building 4, Suite 1103, M/S E-67
Executive Park Drive
Atlanta, GA 30329

State of Nationality

US

State of Residence

US

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☒ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address

THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention, Technology Transfer Office
1600 Clifton Road, N.E., M/S E-67
Atlanta, GA 30333
United States of America

State of Nationality

US

State of Residence

US

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Fiona DOHERTY

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

by fax and post

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

001 404 688 9880

PCT

To:

SPRATT, Gwendolyn D. et al.
NEEDLE & ROSENBERG, P.C.
127 Peachtree Street, N.E.,
Suite 1200
Atlanta, GA 30303-1811
ETATS-UNIS D'AMERIQUE

RECEIVED

SEP 24 2001

NEEDLE & ROSENBERG

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year)	10.09.2001
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Applicant's or agent's file reference 14114.0342P1	REPLY DUE within 1 month(s) and 15 days from the above date of mailing
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International application No. PCT/US00/19267	International filing date (day/month/year) 14/07/2000	Priority date (day/month/year) 15/07/1999
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International Patent Classification (IPC) or both national classification and IPC C07K14/00
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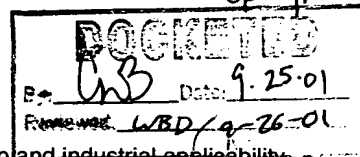
Applicant

THE GOVERNMENT OF THE UNITED STATES OF AM... et al

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- | | | |
|------|-------------------------------------|--|
| I | <input checked="" type="checkbox"/> | Basis of the opinion |
| II | <input type="checkbox"/> | Priority |
| III | <input type="checkbox"/> | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| IV | <input type="checkbox"/> | Lack of unity of invention |
| V | <input checked="" type="checkbox"/> | Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| VI | <input type="checkbox"/> | Certain document cited |
| VII | <input type="checkbox"/> | Certain defects in the international application |
| VIII | <input checked="" type="checkbox"/> | Certain observations on the international application |



3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 15/11/2001.

Name and mailing address of the international preliminary examining authority:
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Barnas, C

Formalities officer (incl. extension of time limits)

Hingel, W

Telephone No. +49 89 2399 8717



WRITTEN OPINION

International application No. PCT/US00/19267

I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, pages:

1-56 as originally filed

Claims, No.:

1-43 as originally filed

Sequence listing part of the description, pages:

1-65, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☒ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

WRITTEN OPINION

International application No. PCT/US00/19267

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Claims 1-8, 12-14, 18-29, 33, 34, 36-43 (NO)

Inventive step (IS) Claims 35 (NO)

Industrial applicability (IA) Claims

2. Citations and explanations
s e separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

s e separate sheet

Re Item II

Priority

The priority document of the present application has not been available at the time of establishing this report. Thus, this report has been based on the assumption that the relevant parts of the claims enjoy the priority claimed. Should it later turn out that this is not the case, the P/X documents cited in the International Search Report could become relevant to the subject matter of the claims.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- D1: WO 97 40147 A (THE GOVERNMENT OF USA) 30 October 1997 (1997-10-30)
D2: WO 89 06658 A (THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL) 27 July 1989 (1989-07-27)
D3: DATABASE CHEMABS [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KUSOV, YU. YU. ET AL: 'Synthetic peptide 62-75 VP3 of hepatitis A virus induces virus-binding antibodies' retrieved from STN Database accession no. 115:229890 CA XP002159265 & VOPR. VIRUSOL. (1991), 36(2), 114-17, 1991,
D4: DATABASE CHEMABS [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; PING, LI HUA ET AL: 'Antigenic structure of human hepatitis A virus defined by analysis of escape mutants selected against murine monoclonal antibodies' retrieved from STN Database accession no. 116:192243 CA XP002159266 & J. VIROL. (1992), 66(4), 2208-16, 1992,

1. Art. 33(2) PCT, Novelty

1.1. The peptides SEQ ID NOs: 7 and 8 (comprising epitopes of both of the HAV polypeptides VP4 and VP2), 12 and 16 (comprising epitopes of VP3), 46 and 48 (P2A), 61 (P2C), 65 (P3A), 66 (P3B), 71 and 72 (P3C) of the specification are already disclosed in D1 with the same denominations (see p. 9-11). All of these peptides have the amino acid glutamine at their carboxyl ends. D1 further discloses the use of said peptides for detecting HAV antibodies in mammalian serum (D1: claim 52). Because the detection of such antibodies indicates the presence of HAV, said method represents also a procedure for detecting HAV in a mammal. D1 further discloses the use of said antibodies for acute

phase infection and convalescence (see p. 37, ln. 13-25).

D1 is therefore novelty destroying for **claims 1-8, 12-14, 18-29, 33, 34 and 36-43.**

1.2. D2 (p. 11, ln. 4 and claims 3 and 4) discloses two peptides (DSVGQQ and SDSVGQ) containing epitopes of the VP3 polypeptide. Said epitopes are present in the peptides SEQ ID NOs: 13-15 of the specification. These two peptides are embraced by claims 1, 2, 6 and 8. D2 (p. 12, ln. 23-29, claim 15) further discloses the use of said peptides for diagnostic purposes and the detection of HAV antibodies.

D2 is, therefore, novelty for claims 1, 2, 6, 8, 33, 36, 42 and 43.

1.3. D3 discloses the peptide AQFPFNASDSVGQQ containing an epitope of the VP3 polypeptide. The sequence of this peptide was derived from the Chemical Abstract corresponding to D3. Said sequence overlaps with the SEQ ID NOs: 13-15 of the specification. The peptide of D3 is, therefore embraced by claims 1, 2 and 6. Because the peptide of D3 and SEQ ID NOs: 13-15 contain the residues Asp-70 and Gln-74 which are suggested to contribute to epitopes (see D4), all of these peptides are expected to bind the same antibodies.

D3 is, therefore, novelty destroying for claims 1, 2, 6 and 8.

2. Art. 33(3) PCT, Inventive Step

The use of synthetic peptides with a label for the detection of antibodies is a standard method in this field. The skilled person would, therefore, use such labelled peptides when carrying out the methods of D1 (closest prior art) or D2 without the exercise of inventive skill. **Claim 35** is, therefore, not inventive.

Re Item VIII

Certain observations on the international application

Art. 6 PCT, Clarity

Dependent claims 22 and 23 refer to "peptides of claim 18" and describe sequences

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/US00/19267

of the P3A protein. Claim 18, however, is directed to the P2C protein. Claims 22 and 23 have, therefore been examined as referring to claim 21 (see p. 19, ln. 2-9 of the specification).

The applicant is requested to file new claims and/or explanations which take account of the above comments. The attention of the applicant is drawn to the fact that the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, Art. 34 (2) PCT. Therefore, the applicant is asked to indicate the basis of any amendments to the claims in the application documents originally filed.

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

RECEIVED NOV 26 2001 NEEDLE & ROSENBERG		PCT NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)	
To: SPRATT, Gwendolyn D. et al. NEEDLE & ROSENBERG, P.C. 127 Peachtree Street, N.E., Suite 1200 Atlanta, GA 30303-1811 ETATS-UNIS D'AMERIQUE		Date of mailing (day/month/year) 19.11.2001	
Applicant's or agent's file reference 14114.0342P1		IMPORTANT NOTIFICATION	
International application No. PCT/US00/19267	International filing date (day/month/year) 14/07/2000	Priority date (day/month/year) 15/07/1999	
Applicant THE GOVERNMENT OF THE UNITED STATES OF AM... et al			

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER



The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

GDS/WBD/TMH

DOCKETED	
By <i>adm/gma</i>	Date <i>11/24/01</i>
Reviewed _____	Name/Date _____


Name and mailing address of the IPEA/  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hingel, W Tel. +49 89 2399-8717	
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 14114.0342P1		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/19267	International filing date (day/month/year) 14/07/2000	Priority date (day/month/year) 15/07/1999	
International Patent Classification (IPC) or national classification and IPC C07K14/00			
Applicant THE GOVERNMENT OF THE UNITED STATES OF AM... et al			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application 			
Date of submission of the demand 09/02/2001		Date of completion of this report 19.11.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Barnas, C Telephone No. +49 89 2399 7469	



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/19267

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-56 as originally filed

Claims, No.:

1-43 as originally filed

Sequence listing part of the description, pages:

1-65, as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☒ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/19267

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	9-11, 15-17, 30-32, 35
	No:	Claims	1-8, 12-14, 18-29, 33, 34, 36-43
Inventive step (IS)	Yes:	Claims	9-11, 15-17, 30-32
	No:	Claims	35
Industrial applicability (IA)	Yes:	Claims	1-43
	No:	Claims	

- 2. Citations and explanations**
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/19267

Re Item II

Priority

The priority document of the present application has not been available at the time of establishing this report. Thus, this report has been based on the assumption that the relevant parts of the claims enjoy the priority claimed. Should it later turn out that this is not the case, the P/X documents cited in the International Search Report could become relevant to the subject matter of the claims.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- D1: WO 97 40147 A (THE GOVERNMENT OF USA) 30 October 1997 (1997-10-30)
D2: WO 89 06658 A (THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL) 27 July 1989 (1989-07-27)
D3: DATABASE CHEMABS [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KUSOV, YU. YU. ET AL: 'Synthetic peptide 62-75 VP3 of hepatitis A virus induces virus-binding antibodies' retrieved from STN Database accession no. 115:229890 CA XP002159265 & VOPR. VIRUSOL. (1991), 36(2), 114-17, 1991,
D4: DATABASE CHEMABS [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; PING, LI HUA ET AL: 'Antigenic structure of human hepatitis A virus defined by analysis of escape mutants selected against murine monoclonal antibodies' retrieved from STN Database accession no. 116:192243 CA XP002159266 & J. VIROL. (1992), 66(4), 2208-16, 1992,

1. Art. 33(2) PCT, Novelty

1.1. The peptides SEQ ID NOs: 7 and 8 (comprising epitopes of both of the HAV polypeptides VP4 and VP2), 12 and 16 (comprising epitopes of VP3), 46 and 48 (P2A), 61 (P2C), 65 (P3A), 66 (P3B), 71 and 72 (P3C) of the specification are already disclosed in D1 with the same denominations (see p. 9-11). All of these peptides have the amino acid glutamine at their carboxyl ends. D1 further discloses the use of said peptides for detecting HAV antibodies in mammalian serum (D1: claim 52). Because the detection of such antibodies indicates the presence of HAV, said method represents also a procedure for detecting HAV in a mammal. D1 further discloses the use of said antibodies for acute

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/19267

phase infection and convalescence (see p. 37, ln. 13-25).

D1 is therefore novelty destroying for **claims 1-8, 12-14, 18-29, 33, 34 and 36-43.**

1.2. D2 (p. 11, ln. 4 and claims 3 and 4) discloses two peptides (DSVGQQ and SDSVGQ) containing epitopes of the VP3 polypeptide. Said epitopes are present in the peptides SEQ ID NOs: 13-15 of the specification. These two peptides are embraced by claims 1, 2, 6 and 8. D2 (p. 12, ln. 23-29, claim 15) further discloses the use of said peptides for diagnostic purposes and the detection of HAV antibodies.

D2 is, therefore, novelty for claims 1, 2, 6, 8, 33, 36, 42 and 43.

1.3. D3 discloses the peptide AQFPFNASDSVGQQ containing an epitope of the VP3 polypeptide. The sequence of this peptide was derived from the Chemical Abstract corresponding to D3. Said sequence overlaps with the SEQ ID NOs: 13-15 of the specification. The peptide of D3 is, therefore embraced by claims 1, 2 and 6. Because the peptide of D3 and SEQ ID NOs: 13-15 contain the residues Asp-70 and Gln-74 which are suggested to contribute to epitopes (see D4), all of these peptides are expected to bind the same antibodies.

D3 is, therefore, novelty destroying for claims 1, 2, 6 and 8.

2. Art. 33(3) PCT, Inventive Step

The use of synthetic peptides with a label for the detection of antibodies is a standard method in this field. The skilled person would, therefore, use such labelled peptides when carrying out the methods of D1 (closest prior art) or D2 without the exercise of inventive skill. **Claim 35** is, therefore, not inventive.

3. Additional Observations

D1 (closest prior art) also discloses immunogenic peptides containing epitopes of the HAV polypeptides VP1, P2B and P3D. These peptides, however, do not contain Gln at their C-termini. The difference between D1 and claims 9-11, 15-17 and 30-32 are, therefore, immunogenic peptides containing epitopes of the HAV polypeptides VP1, P2B

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US00/19267

and P3D with the amino acid Gln at their C-termini. The cited prior art does not contain any indication to produce such peptides. Claims 9-11, 15-17 and 30-32 are, therefore, inventive.

Re Item VIII

Certain observations on the international application

Art. 6 PCT, Clarity

Dependent claims 22 and 23 refer to "peptides of claim 18" and describe sequences of the P3A protein. Claim 18, however, is directed to the P2C protein. Claims 22 and 23 have, therefore, been examined as referring to claim 21 (see p. 19, ln. 2-9 of the specification).

ATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NR

To:
JONES & ASKEW, LLP
Attn. PRIOR, Kimberly J.
2400 Monarch Tower
3424 Peachtree Road, N.E.
Atlanta, GA 30326
UNITED STATES OF AMERICA

FEB 26 2001

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) 21/02/2001	
Applicant's or agent's file reference 03063-0461WP 14114.0342P1	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US 00/ 19267	International filing date (day/month/year) 14/07/2000
Applicant THE GOVERNMENT OF THE UNITED STATES OF AMERICA....	

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

DDO/WBD/Tmtb
DOCKETED
By *Jmw* Date *3/5/01*
Reviewed _____
Name / Date _____

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.


☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Geertruida Groeneveld-Van der Spek
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NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 03063-0461WP	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/19267	International filing date (day/month/year) 14/07/2000	(Earliest) Priority Date (day/month/year) 15/07/1999
Applicant THE GOVERNMENT OF THE UNITED STATES OF AMERICA....		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/19267

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/10 G01N33/569 G01N33/576

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 40147 A (THE GOVERNMENT OF USA) 30 October 1997 (1997-10-30) see throughout, especially the sequences 7-8,12,16,46,48,61,65-66 ---	1,2,6,9, 12,15, 18,21, 24,27, 30,33, 35,36, 39,42,43
X	WO 89 06658 A (THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL) 27 July 1989 (1989-07-27) claims 3,4 --- -/--	1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *8* document member of the same patent family

Date of the actual completion of the international search

2 February 2001

Date of mailing of the international search report

21/02/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Masturzo, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/19267

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KUSOV, YU. YU. ET AL: "Synthetic peptide 62-75 VP3 of hepatitis A virus induces virus-binding antibodies" retrieved from STN Database accession no. 115:229890 CA XP002159265 & VOPR. VIRUSOL. (1991), 36(2), 114-17 , 1991, abstract</p>	<p>1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43</p>
X	<p>DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; PING, LI HUA ET AL: "Antigenic structure of human hepatitis A virus defined by analysis of escape mutants selected against murine monoclonal antibodies" retrieved from STN Database accession no. 116:192243 CA XP002159266 & J. VIROL. (1992), 66(4), 2208-16 , 1992, abstract</p>	<p>1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43</p>
P,X	<p>Y E KHUDYAKOV ET AL.: "Antigenic epitopes of hepatitis A virus polyprotein" VIROLOGY., vol. 260, no. 2, 1 August 1999 (1999-08-01), pages 260-272, XP002159264 ACADEMIC PRESS, ORLANDO., US ISSN: 0042-6822 the whole document</p>	<p>1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/19267

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9740147 A	30-10-1997	AU 2810397 A CA 2251977 A EP 0904365 A	12-11-1997 30-10-1997 31-03-1999
WO 8906658 A	27-07-1989	AU 3048689 A	11-08-1989

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 January 2001 (25.01.2001)

PCT

(10) International Publication Number
WO 01/05824 A3

(51) International Patent Classification⁷: C07K 14/10,
G01N 33/569, 33/576

(74) Agents: PRIOR, Kimberly J. et al.; Jones & Askew, LLP,
2400 Monarch Tower, 3424 Peachtree Road, N.E. Atlanta
GA 30326 (US).

(21) International Application Number: PCT/US00/19267

(22) International Filing Date: 14 July 2000 (14.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/144,412 15 July 1999 (15.07.1999) US

(71) Applicant (for all designated States except US): THE
GOVERNMENT OF THE UNITED STATES OF
AMERICA, as represented by THE SECRETARY OF
THE DEPARTMENT OF HEALTH AND HUMAN
SERVICES [US/US]; Centers for Disease Control and
Prevention, Technology Transfer Office, Building 4,
Suite 1103, M/S E-67, Executive Park Drive, Atlanta, GA
30329 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— With international search report.

(88) Date of publication of the international search report:
10 May 2001

(72) Inventors; and

(75) Inventors/Applicants (for US only): FIELDS, Howard,
A. [US/US]; 1823 Jackson Creek Drive, Marietta, GA
30068 (US). KHUDYAKOV, Yury, E. [RU/US]; 4354
Tremont Court, Duluth, GA 30096 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYNTHETIC PEPTIDES IMMUNOREACTIVE WITH HEPATITIS A VIRUS ANTIBODIES

(57) Abstract: Synthetic peptides immunoreactive with hepatitis A virus (HAV) antibodies are provided. The peptides are useful as laboratory reagents to detect or quantify HAV antibodies in biological samples in clinical or research-based assays and for inducing an immune response to HAV when administered to a human or animal. The peptides contain antigenic epitopes, modified antigenic epitopes or combinations of epitopes of the major structural capsid polypeptides or non-structural polypeptides of HAV and contain one or more molecules of the amino acid glutamine (Q) at the carboxyl end of the peptide, which enhances immunoreactivity and immunogenicity, particularly IgM antibody reactivity.

WO 01/05824 A3

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT 00/19267

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07K14/10 G01N33/569 G01N33/576

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 40147 A (THE GOVERNMENT OF USA) 30 October 1997 (1997-10-30) see throughout, especially the sequences 7-8,12,16,46,48,61,65-66 ---	1,2,6,9, 12,15, 18,21, 24,27, 30,33, 35,36, 39,42,43
X	WO 89 06658 A (THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL) 27 July 1989 (1989-07-27) claims 3,4 --- -/--	1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43

☒ Further documents are listed in the continuation of box C.

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- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

2 February 2001

Date of mailing of the international search report

21/02/2001

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

Authorized officer

Masturzo, P

INTERNATIONAL SEARCH REPORT

Inte ional Application No

PCT 00/19267

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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X	<p>DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; PING, LI HUA ET AL: "Antigenic structure of human hepatitis A virus defined by analysis of escape mutants selected against murine monoclonal antibodies" retrieved from STN Database accession no. 116:192243 CA XP002159266 & J. VIROL. (1992), 66(4), 2208-16 , 1992, abstract</p>	<p>1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43</p>
P,X	<p>Y E KHUDYAKOV ET AL.: "Antigenic epitopes of hepatitis A virus polyprotein" VIROLOGY., vol. 260, no. 2, 1 August 1999 (1999-08-01), pages 260-272, XP002159264 ACADEMIC PRESS, ORLANDO., US ISSN: 0042-6822 the whole document</p>	<p>1,2,12, 15,18, 21,24, 27,30, 33,35, 36,39, 42,43</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT 00/19267

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9740147	A	30-10-1997	AU 2810397 A	12-11-1997
			CA 2251977 A	30-10-1997
			EP 0904365 A	31-03-1999
WO 8906658	A	27-07-1989	AU 3048689 A	11-08-1989